HYDROCARBON PROCESSING

1980 Annual Editorial Index

Volume 59

ABSORPTION
Determine equilibrium absorption rates ..... Apr. 122
NGL refrigerant improves recovery ..... Apr. 138
Engineering aspects of the EXOL N lube process ..... May 119
Solvent treat resids ..... May 150
Refining process handbook ..... Sept. 93

ACID GASES
Destroy NO_x catalytically ..... Feb. 87
Refining operations updated ..... Mar. 55
Control DEA degredation ..... Apr. 103
Purify CO_2 for use ..... Apr. 113
Determine equilibrium absorption rates ..... Apr. 122
Off-gas aids Claus operations ..... Apr. 127
Optimize Claus control ..... Apr. 133
Curve fitting by computer ..... Aug. 107
Refining process handbook ..... Sept. 93
Upgrading coal products can affect environment ..... Oct. 79
Make formic acid from CO ..... Nov. 103
Formic acid ..... Nov. 120
Incentive for sulfur-tolerant methanol catalyst ..... Nov. 157
FGD good with coal conversion ..... Dec. 117

ACIDS/CARBOXYLIC
Make formic acid from CO ..... Nov. 103
Formic acid ..... Nov. 120

ACRYLICS
From hydrocarbons to petrochemicals (Part 18) ..... Apr. 211
Erratum ..... *Aug. 56*

ACRYLONITRILE (also ACRYLONITRILE-BUTADIENE RUBBER)
From hydrocarbons to petrochemicals (Part 18) ..... Apr. 211
Erratum ..... *Aug. 56*
From hydrocarbons to petrochemicals (Part 19) ..... May 207
Erratum ..... *Aug. 58*

ADDITIVES
Refining process handbook ..... Sept. 93

ADSORPTION
Refining process handbook ..... Sept. 93
Make olefins from syn gas ..... Nov. 139

AERATORS
Treat waste water biologically ..... Nov. 191

ALCOHOLS
Components for unleaded gasoline ..... Feb. 57
Coal to gasoline via syn gas ..... Feb. 67
Engines run well on alcohols ..... Feb. 72
Developments in West Europe's chemical industry are favorable ..... Mar. 34-J
Better use of butenes for high-octane gasoline ..... Apr. 185
Hydrogen for future refining ..... Aug. 85
Now, MTBE from butane ..... Oct. 91
2-EH: What you should know ..... Nov. 93
Make formic acid from CO ..... Nov. 103
Formic acid ..... Nov. 120
Hi-yield DMT by Mitsui ..... Nov. 143
Incentive for sulfur-tolerant methanol catalyst ..... Nov. 157

ALDEHYDES
2-EH: What you should know ..... Nov. 93

ALDOLIZATION
2-EH: What you should know ..... Nov. 93

ALDOS
2-EH: What you should know ..... Nov. 93

ALDOX
2-EH: What you should know ..... Nov. 93

ALKYLATION
Components for unleaded gasoline ..... Feb. 57
Coal to gasoline via syn gas ..... Feb. 67
Refining operations update ..... Mar. 55
Better use of butenes for high-octane gasoline ..... Apr. 185
How first Dimersol is working ..... May 143
Refining process handbook ..... Sept. 93
Is more refining needed? ..... Nov. 171

AMINES
Control DEA degredation ..... Apr. 103
Determine equilibrium absorption rates ..... Apr. 122
Refining process handbook ..... Sept. 93

AMMONIA
Destroy NO_x catalytically ..... Feb. 87
Reliability: Key to NH_3 profits ..... Apr. 68-G
Hydrogen for future refining ..... Aug. 85
Models aid process control ..... Nov. 197

ANALYZING see also INSTRUMENTATION
Predict pump problems with IFD ..... Jan. 87
Vibration analysis pinpoints coupling problems ..... Jan. 95
Plant testing peaks performance ..... May 159
Applying analyzers in the process industries ..... June 45
New strategy improves dual composition column control ..... June 51
New analyzers improve reformer efficiency ..... June 60
Combustion control and analyzers: What's really needed? ..... June 65
Stability of alternate fuels ..... July 77
Insulation design: Using the new computer programs ..... July 83
New ways to estimate characterization of lube cuts ..... July 171
Curve fitting by computer ..... Aug. 107
New method shows underground cable ratings are conservative ..... Sept. 251
Vacuum steam condensers: Air vs. water cooling ..... Sept. 257

ANHYDRIDES
Compare maleic anhydride routes ..... June 83
Benzene or butane for MAN ..... Nov. 149

ANTIKNOCK RATING
Components for unleaded gasoline ..... Feb. 57
Economics of component splitting ..... Feb. 60
Coal to gasoline via syn gas ..... Feb. 67
Refining operations update ..... Mar. 55
Better use of butenes for high-octane gasoline ..... Apr. 185
How first Dimersol is working ..... May 143
Refining process handbook ..... Sept. 93
Now, MTBE from butane ..... Oct. 91

AROMATICS
Sieves for mixed xylenes separation ..... Jan. 133
Aromatics outlook for Western Europe ..... Mar. 83
Refining process handbook ..... Sept. 93
Make olefins from syn gas ..... Nov. 139
Hi-yield DMT by Mitsui ..... Nov. 143
Kinetics of cat reforming ..... Nov. 163
Aromatics from scrap tires ..... Nov. 187

ASPHALT
Solvent treat resids ..... May 150
Refining process handbook ..... Sept. 93

BACTERIA
Use enzymes as catalysts for alkene oxide production ..... Nov. 135

BEARINGS
Maintenance techniques for turbomachinery ..... Jan. 71
Apply pure oil mist lubrication on a large scale ..... Oct. 125

BENFIELD PROCESS
Incentive for sulfur-tolerant methanol catalyst ..... Nov. 157

BENZENE
Aromatics outlook for Western Europe ..... Mar. 83
Compare maleic anhydride routes ..... June 83
Benzene or butane for MAN ..... Nov. 149

BIOMASS
How to convert biomass to SNG ..... Apr. 117

BOC UNIBON PROCESS
New data for RCD Unibon process ..... June 73
Erratum ..... *Sept. 91*

BOILING POINT
How steam alters crude ..... Jan. 115
Simplify property predictions ..... Mar. 115
Improve vapor pressure prediction ..... July 163
Erratum ..... *Sept. 91*

BTX
Aromatics outlook in Western Europe ..... Mar. 83
Make petrochemical feedstocks with coal liquefaction ..... May 152

BUTADIENE
From hydrocarbons to petrochemicals (Part 19) ..... May 207
Erratum ..... *Aug. 58*
Light olefin trends in Western Europe ..... May 223
BUTANE
Now, MTBE from butane ..... Oct. 91
Benzene or butane for MAN ..... Nov. 149

BUTENES
Better use of butenes for high-octane gasoline ..... Apr. 185
Compare maleic anhydride routes ..... June 83
Refining process handbook ..... Sept. 93

CALCINING see COKING

CARBON
Pick a process by design ..... Mar. 75
CARBON BLACK
Aromatics from scrap tires ..... Nov. 187

CATALYST
A new concept for...Three phase fluidized beds ..... Jan. 123
Destroy NO_x catalytically ..... Feb. 87
Predict carbonation rate on iron catalyst ..... Feb. 92
Refining operations update Mar.55
Ruthenium catalysts improve methanation ..... Apr. 107
Upgrade naphtha to ... fuels and feedstocks ..... May 110
Erratum ..... *July 54*
How to select hydrotreating catalyst ..... May 139
From hydrocarbons to petrochemicals (Part 19) ..... May 207
Erratum ..... *Aug. 58*
New data for RCD Unibon ..... June 73
Erratum ..... *Sept. 91*
Compare maleic anhydride routes ..... June 83
Refining process handbook ..... Sept. 93
Upgrading coal products can affect environment ..... Oct. 79
Make formic acid from CO ..... Nov. 103
Up petrochemical value by liquid phase catalytic oxidation ..... Nov. 107
Formic acid ..... Nov. 120
Use BPP for polypropylene ..... Nov. 131
Use enzymes as catalysts for alkene oxide production ..... Nov. 135
Make olefins from syn gas ..... Nov. 139
Hi-yield DMT by Mitsui ..... Nov. 143
Benzene or butane for MAN ..... Nov. 149
Incentive for sulfur-tolerant methanol catalyst ..... Nov. 157
Kinetics of cat reforming ..... Nov. 163
Hydrogenate AMS to cumene ..... Nov. 179
Estimating H-Oil costs ..... Dec. 101

CATALYTIC CRACKING
Components for unleaded gasoline ..... Feb. 57
Economics of component splitting ..... Feb. 60
Refining operations update ..... Mar. 55
FCCU expanders: What's the payout? ..... Apr. 173
New roles for thermal cracking ..... May 101
Is more refining needed? ..... Nov. 171

CATALYTIC REFORMING see REFORMING

CAUSTIC
Packed beds for best sulfur removal ..... Oct. 99
CHEMICALS/PETROCHEMICALS
Developments in West Europe's chemical industry are favorable ..... Mar. 34-J
Outlook for Japan's chemical industry ..... Aug. 52-F
CHROMATOGRAPHY
Sieves for mixed xylenes separation ..... Jan. 133
Stability of alternate fuels ..... July 77
CLARIFICATION
Improve water treating systems ..... Jan. 99
CLAUS PROCESS
Off-gas aids Claus operations ..... Apr. 127
Optimize Claus control ..... Apr. 133

COAL
Coal to gasoline via syn gas ..... Feb. 67
Engines run well on alcohol ..... Feb. 72
Data bank for synthetic fuels (Part 1) ..... May 229
Possibilities for coal liquefaction ..... May 237
Energy — progress and prospects ..... July 57
Coal conversion today ..... July 68
Erratum ..... *Oct. 57*
Stability of alternate fuels ..... July 77
Process coal using nuclear energy ..... July 153
South Africa's response to the energy crisis ..... July 50-J
Data bank for synthetic fuels (Part 2) ..... Aug. 117
Convert coal now ..... Sept. 238
Process pollutes very little ..... Oct. 66
Upgrading coal products can affect environment ..... Oct. 79
Data bank for synthetics fuels (Part 3) ..... Nov. 225
FGD good with coal conversion ..... Dec. 117

COATINGS
From hydrocarbons to petrochemicals (Part 17) ..... Jan. 141
Tank insulation costs up? Use urethane foam ..... May 197

CODES see STANDARDS

COKING
Refining operations update ..... Mar. 55
New roles for thermal cracking ..... May 101
Refining process handbook ..... Sept. 93
Estimating H-Oil costs ..... Dec. 101
COMBUSTION
Control of NO_x emissions ..... Jan. 167
Coal conversion today ..... July 68
Erratum ..... *Oct. 57*
New ways to estimate characterization of lube cuts ..... July 171

COMPRESSORS
Maintenance techniques for turbomachinery ..... Jan. 71
Vibration analysis pinpoints coupling problems ..... Jan. 95
Synchronous motors ... avoid torsional vibration problems ..Feb. 97
Stepwise solution to vibrating equipment foundation design ..... Mar. 93
FCCU expanders: What's the payout? ..... Apr. 173
Better service from rotary screw air compressor packages ..May 181
Shaft overlays proven effective ..... May 191
Optimize cold cycles ..... July 89
Easy alignment measurements for gear-type couplings ....Sept. 245
Estimate fan flow ..... Oct. 134
Consider variable pitch fans ..... Dec. 122

COMPUTERS
Can a computer reduce your maintenance? ..... Jan. 79
How steam alters crude ..... Jan. 115
Refining operations update ..... Mar. 55
Better batch processes control ..... Mar. 101
Crude unit computer control...How good is it? ..... Apr. 145
Understand minicomputer control systems ..... Apr. 153
Solve more distillation problems (Part 9) ..... Apr. 195
Insulation design: Using the new computer programs ..... July 83
Optimize cold cycles ..... July 89
How to implement digital control ..... July 115
CRT based systems: What's in it for the operator? ..... July 135
Solve more distillation problems (Part 10) ..... July 144
Computer aids short-cut distillation design ..... Aug. 79
Curve fitting by computer ..... Aug. 107
Kinetics of cat reforming ..... Nov. 163
Models aid process control ..... Nov. 197
Program calculates gas physical properties ..... Nov. 213
Perform pipe stress analysis on a minicomputer ..... Dec. 87

CONSTRUCTION
HPI construction trends ..... Feb. 34-B
Refinery on skids speeds startup ..... May 161
Iraq's newest industrial complex ..... June 36-O
Colombia's *Planta de Balance* ..... Oct. 54-M

CONSTRUCTION BOXSCORE — Feb., June, Oct.

COOLING TOWERS
Keys to successful cooling tower operation ..... May 203

CORROSION
Refining operations update ..... Mar. 55
Guidelines help combustion engineers ..... Nov. 205
Mercury — LNG's problem ..... Nov. 237

COSTS
Sieves for mixed xylenes separation ..... Jan. 133
Major factors to consider in project financing ..... Jan. 189
Economics of component splitting ..... Feb. 60
Coal to gasoline via syn gas ..... Feb. 67

Improve naphtha cracker operation ..... Feb. 79
Erratum ..... *May 99*
Destroy NO_x catalytically ..... Feb. 87
HPI construction trends ..... Feb. 34-B
Trends in suspension PVC manufacture ..... Mar. 39
Treat fuel gas — save energy ..... Mar. 67
Erratum ..... *May 99*
Aromatics outlook in Western Europe ..... Mar. 83
World money resources for project finance ..... Mar. 167
Developments in West Europe's chemical industry are favorable ..... Mar. 34-J

LNG grows as world energy resource ..... Apr. 130
Crude unit computer control ... How good is it? ..... Apr. 145
Insulating tanks: What it costs and how it's done ..... Apr. 165
FCCU expanders: What's the payout? ..... Apr. 173
Better use of butenes for high-octane gasoline ..... Apr. 185
Cut steam cracker capital costs ..... Apr. 233
Reliability: Key to NH_3 profits ..... Apr. 68-G
Upgrade naphtha to ... fuels and feedstocks ..... May 110
Erratum ..... *July 54*

How first Dimersol is working ..... May 143
Make petrochemical feedstocks with coal liquefaction ..... May 152
Improve processes by OSA ..... May 215
Light olefin trends in Western Europe ..... May 223
Compare maleic anhydride routes ..... June 83
Membrane separation saves energy ..... July 65
Process coal using nuclear energy ..... July 153

Hydrogen for future refining ..... Aug. 85
Up olefin plant profits by steady state simulation ..... Aug. 95
Outlook for Japan's chemical industry ..... Aug. 52-F
Improve demethanizer operation ..... Sept. 223
Convert coal now ..... Sept. 238
Mexican energy, economics and exploration ..... Sept. 50-F
Refining process handbook ..... Sept. 93
Minimize stormwater system costs ..... Oct. 59
Now, MTBE from butane ..... Oct. 91
Packed beds best for sulfur removal ..... Oct. 99
Cut demethanizer energy costs ..... Oct. 105
Olefins shift to heavy liquids ..... Oct. 113
Make formic acid from CO ..... Nov. 103
Formic acid ..... Nov. 120
Use BPP for polypropylene ..... Nov. 131
Hi-yield DMT by Mitsui ..... Nov. 143
Incentive for sulfur-tolerant methanol catalyst ..... Nov. 157
Is more refining needed? ..... Nov. 171

Hydrogenate AMS to cumene ..... Nov. 179
Aromatics from scrap tires ..... Nov. 187
Design plant-wide heat recovery ..... Nov. 245
Cut olefin costs by optimum coupling ..... Dec. 105
Refine LPG for process flexibility ..... Dec. 111
FGD good with coal conversion ..... Dec. 117

COUPLINGS
Maintenance techniques for turbomachinery ..... Jan. 71
Vibration analysis pinpoints coupling problems ..... Jan. 95

CRACKING/CHEMICALS
A new concept for ... Three phase fluidized beds ..... Jan. 123
Components for unleaded gasoline ..... Feb. 57
Economics of component splitting ..... Feb. 60
Improve naphtha cracker operation ..... Feb. 79
Erratum ..... *May 99*
Refining operations update ..... Mar. 55
Why an LPG olefins plant? ..... Apr. 223
Cut steam cracker capital costs ..... Apr. 233
New roles for thermal cracking ..... May 101
Improve processes by OSA ..... May 215
Light olefin trends in Western Europe ..... May 223

New data for RCD Unibon ..... June 73
Erratum ..... *Sept. 91*
Hydrogen for future refining ..... Aug. 85
Up olefin plant profits by steady state simulation ..... Aug. 95
Improve demethanizer operation ..... Sept. 223
Refining process handbook ..... Sept. 93
Cut demethanizer energy costs ..... Oct. 105
Olefins shift to heavy liquids ..... Oct. 113
Kinetics of cat reforming ..... Nov. 163
Is more refining needed? ..... Nov. 171
Aromatics from scrap tires ..... Nov. 187
Estimating H-Oil costs ..... Dec. 101
Cut olefin costs by optimum coupling ..... Dec. 105

CRUDE OILS
How steam alters crude ..... Jan. 115
Crude unit computer control ... How good is it? ..... Apr. 145
New data for RCD Unibon ..... June 73
Erratum ..... *Sept. 91*
Refining process handbook ..... Sept. 93
Is more refining needed? ..... Nov. 171
Guidelines help combustion engineers ..... Nov. 205
Estimate viscosity vs. temp. ..... Dec. 131

CUMENE
Hydrogenate AMS to cumene ..... Nov. 179

CYCLOPARAFFINS
From hydrocarbons to petrochemicals (Part 18) ..... Apr. 211
Erratum ..... *Aug. 56*

DEASPHALTING
Lube and wax capacity identified ..... May 157
New data for RCD Unibon ..... June 73
Erratum ..... *Sept. 91*
Refining process handbook ..... Sept. 93

DEHYDROGENATION
Refining process handbook ..... Sept. 93
Now, MTBE from butane ..... Oct. 91
Kinetics of cat reforming ..... Nov. 163

DENITROGENATION
How to select hydrotreating catalyst ..... May 139
Refining process handbook ..... Sept. 93

DENSITY
New ways to estimate characterization of lube cuts ..... July 171

DESALTING
Better ways to clean crude storage tanks and desalters ..... Jan. 82

DESIGN — see also SPECIFIC EQUIPMENT
Consider nitrogen rejection design ..... Aug. 111
Let's build a plant ..... Nov. 249

DESULFURIZATION
Control DEA degredation ..... Apr. 103
How to select hydrotreating catalyst ..... May 139
New data for RCD Unibon ..... June 73
Erratum ..... *Sept. 91*
Hydrogen for future refining ..... Aug. 85
Refining process handbook ..... Sept. 93
Incentive for sulfur-tolerant methanol catalyst ..... Nov. 157
FGD good with coal conversion ..... Dec. 117

DEWAXING
Refining process handbook ..... Sept. 93

DIMERSOL PROCESS
How first Dimersol is working ..... May 143

DIMETHYL TEREPHTHALATE
From hydrocarbons to petrochemicals (Part 18) ..... Apr. 211
Erratum ..... *Aug. 56*
Hi-yield DMT by Mitsui ..... Nov. 143

DISTILLATION
Economics of component splitting ..... Feb. 60
Refining operations update ..... Mar. 55
Crude unit control ... How good is it? ..... Apr. 145
Solve more distillation problems (Part 9) ..... Apr. 195
New strategy improves dual composition column control ... June 51
Solve more distillation problems (Part 10) ..... July 144
Computer aids short-cut distillation design ..... Aug. 79
Improve demethanizer operation ..... Sept. 223
Refining process handbook ..... Sept. 93
Cut demethanizer energy costs ..... Oct. 105
Improve reliability of advanced tower control ..... Oct. 117
Is more refining needed? ..... Nov. 171

DRYING
Refining process handbook ..... Sept. 93

ECONOMICS see COSTS

ELASTOMERS
From hydrocarbons to petrochemicals (Part 19) ..... May 207
Erratum ..... *Aug. 58*

ELECTRICAL EQUIPMENT
Is your power distribution system reliable? ..... May 169
Combined cycles: Today and tomorrow ..... July 73
New method shows underground cable ratings are conservative ..... Sept. 251

ENGINES
Engines run well on alcohol ..... Feb. 72
Stepwise solution to vibrating equipment foundation design ..... Mar. 93

ENVIRONMENT
Design of aerobic treatment units (Part 3) ..... Jan. 159
Control of NO_x emissions ..... Jan. 167
Destroy NO_x catalytically ..... Feb. 87
Refining operations update ..... Mar. 55
Combustion: Efficiency vs. NO_x ..... May 130
Landfarming fills an HPI need ..... June 97
Refining process handbook ..... Sept. 93
Minimize stormwater system costs ..... Oct. 59
Lube solvents no threat to waste treatment ..... Oct. 63
Process pollutes very little ..... Oct. 66

Process problems to profits ..... Oct. 71
Nonchromate treatment performs well ..... Oct. 75
Upgrading coal products can affect environment ..... Oct. 79
Packed beds best for sulfur removal ..... Oct. 99
Formic acid ..... Nov. 120
Benzene or butane for MAN ..... Nov. 149
Aromatics from scrap tires ..... Nov. 187
Treat waste water biologically ..... Nov. 191
Let's build a plant ..... Nov. 249

ENZYMES
Use enzymes as catalysts for alkene oxide production ..... Nov. 135
ESTERS
From hydrocarbons to petrochemicals (Part 18) ..... Apr. 211
Erratum ..... *Aug. 56*
ETHANE
Why an LPG olefins plant? ..... Apr. 223
Make petrochemical feedstocks with coal liquefaction ..... May 152
ETHERS
Components for unleaded gasoline ..... Feb. 57
Coal to gasoline via syn gas ..... Feb. 67
Better use of butenes for high-octane gasoline ..... Apr. 185
Now, MTBE from butane ..... Oct. 91

ETHYLBENZENE
Sieves for mixed xylenes separation ..... Jan. 133

ETHYLENE
Improve naphtha cracker operation ..... Feb. 79
Erratum ..... *May 99*
Why an LPG olefins plant? ..... Apr. 223
Cut steam cracker capital costs ..... Apr. 233
Make petrochemical feedstocks with coal liquefaction ..... May 152
Improve processes by OSA ..... May 215
Light olefin trends in Western Europe ..... May 223
Challenges from the Canadian North ..... May 68-G
Up olefin plant profits by steady state simulation ..... Aug. 95
Improve demethanizer operation ..... Sept. 223
Cut demethanizer energy costs ..... Oct. 105
Olefins shift to heavy liquids ..... Oct. 113
Cut olefin costs by optimum coupling ..... Dec. 105

EXCHANGERS see HEAT TRANSFER

EXOL N PROCESS
Engineering aspects of the Exol N lube process ..... May 119
EXPANDERS
FCCU expanders: What's the payout? ..... Apr. 173

EXTRACTION see ABSORPTION

FERMENTATION
Engines run well on alcohols ..... Feb. 72
Use enzymes as catalysts for alkene oxide production ..... Nov. 135
FILTRATION
Improve water treating systems ..... Jan. 99
FLARING
Flare design ... Are current methods too conservative? ..... May 124

FLASH POINT
New ways to estimate characterization of lube cuts ..... July 171

FLOW PROPERTIES
Estimate surface tension changes for liquids ..... Apr. 207
FLUIDIZING
A new concept for ... Three phase fluidized beds ..... Jan. 123

FORECASTING
From hydrocarbons to petrochemicals (Part 17) ..... Jan. 141
Major factors to consider in project financing ..... Jan. 189
Components for unleaded gasoline ..... Feb. 57
HPI construction trends ..... Feb. 34-B
Aromatics outlook in Western Europe ..... Mar. 83
World money resources for project finance ..... Mar. 167
Developments in West Europe's chemical industry are favorable ..... Mar. 34-J

LNG grows as world energy resource ..... Apr. 130
Light olefin trends in Western Europe ..... May 223
Challenges from the Canadian North ..... May 68-G
Energy - progress and prospects ..... July 57
Hydrogen for future refining ..... Aug. 85
What's ahead for U.S. HD-PE? ..... Sept. 231
Mexican energy, economics and exploration ..... Sept. 50-F
Olefins shift to heavy liquids ..... Oct. 113
Make formic acid from CO ..... Nov. 103
Formic acid ..... Nov. 120
Estimate viscosity vs. temp. ..... Dec. 131

FOUNDATIONS
Stepwise solution to vibrating equipment foundation design ..... Mar. 93
Plot plans must include safety ..... July 183
FURFURAL
Refining process handbook ..... Sept. 93

GASIFICATION
Coal to gasoline via syn gas ..... Feb. 67
Engines run well on alcohols ..... Feb. 72
How to convert biomass to SNG ..... Apr. 117
Coal conversion today ..... July 68
Erratum ..... *Oct. 57*
Naphtha wash eliminates soot problem ..... Sept. 237
Convert coal now ..... Sept. 238
Process pollutes very little ..... Oct. 66
Process problems to profits ..... Oct. 71
Gas—energy of the future ..... Nov. 76-O

GENERATORS
Combined cycles: Today and tomorrow ..... July 73
GLYCOLS
From hydrocarbons to petrochemicals (Part 18) ..... Apr. 211
Erratum ..... *Aug. 56*
Refining process handbook ..... Sept. 93

GREASES see LUBRICANTS

HEATERS see HEAT TRANSFER

HEAT EXCHANGERS see HEAT TRANSFER

HEAT TRANSFER
Improve water treating system ..... Jan. 99
Refining operations update ..... Mar. 55
Treat fuel gas - save energy ..... Mar. 67
Erratum ..... *May 99*
Specify the right heat exchanger ..... Apr. 161
Insulating tanks: What it costs and how it's done ..... Apr. 165
Engineering aspects of the EXOL N lube process ..... May 119
Combustion: Efficiency vs. NO_x ..... May 130
Selecting and specifying air-cooled heat exchangers ..... May 173
Tank insulation costs up? Try urethane foam ..... May 197
Keys to successful cooling tower operation ..... May 203
Combustion control and analyzers: What's really needed? ..... June 65
What's the difference between TEMA exchanger classes? ..... June 92
First step: Survey energy losses ..... July 62
Combined cycles: Today and tomorrow ..... July 73
Insulation design: Using the new computer programs ..... July 83
Plot plans must include safety ..... July 183
Improve demethanizer operation ..... Sept. 223
Vacuum steam condensers: Air vs water cooling ..... Sept. 257
Predict heat exchanger outlet temperatures ..... Sept. 262
Cut demethanizer energy costs ..... Oct. 105

Estimate fan flow ..... Oct. 134
Panel evaluates ceramic fibers ..... Oct. 139
Winterizing air cooled heat exchangers ..... Oct. 147
Guidelines help combustion engineers ..... Nov. 205
Design plant-wide heat recovery ..... Nov. 245
Calculate natural frequency of internal lined pipe ..... Dec. 94
Cut olefin costs by optimum coupling ..... Dec. 105
Consider variable pitch fans ..... Dec. 122

HOLLOW FIBERS
Membrane processing favors hydrogen recovery ..... May 115

HYDROCRACKING
Components for unleaded gasoline ..... Feb. 57
Refining operations update ..... Mar. 55
New data for RCD Unibon ..... June 73
Erratum ..... *Sept. 91*
Hydrogen for future refining ..... Aug. 85
Refining process handbook ..... Sept. 93
Upgrading coal products can affect environment ..... Oct. 79
Kinetics of cat reforming ..... Nov. 163

HYDRODEALKYLATION
Kinetics of cat reforming ..... Nov. 163

HYDROGEN
Coal to gasoline via syn gas ..... Feb. 67
Pick a process by design ..... Mar. 75
Membrane processing favors hydrogen recovery ..... May 115
New data for RCD Unibon ..... June 73
Erratum ..... *Sept. 91*
Membrane separation saves energy ..... July 65
Hydrogen for future refining ..... Aug. 85
Naphtha wash eliminates soot problem ..... Sept. 235
Refining process handbook ..... Sept. 93
Hydrogenate AMS to cumene ..... Nov. 179

HYDROGENATION
How to select hydrotreating catalyst ..... May 139
Refining process handbook ..... Sept. 93
Upgrading coal products can affect environment ..... Oct. 79
2-EH: What you should know ..... Nov. 93
Hydrogenate AMS to cumene ..... Nov. 179

HYDROTREATING
Refining operations update ..... Mar. 55
Better use of butenes for high-octane gasolines ..... Apr. 185
Membrane processing favors hydrogen recovery ..... May 115
How to select hydrotreating catalyst ..... May 139
Lube and wax capacity identified ..... May 157
New data for RCD Unibon ..... June 73
Erratum ..... *Sept. 91*
Hydrogen for future refining ..... Aug. 85
Refining process handbook ..... Sept. 93
Upgrading coal products can affect environment ..... Oct. 79

HYSOMER PROCESS
Upgrade naphtha to ... fuels and feedstocks ..... May 110
Erratum ..... *July 54*

INSTRUMENTATION
Predict pump problems with IFD ..... Jan. 87
Vibration analysis pinpoints coupling problems ..... Jan. 95
Use flammable vapor sensors? ..... Jan. 211
Better batch processes control ..... Mar. 101
Optimize Claus control ..... Apr. 133
Crude unit computer control ... How good is it? ..... Apr. 145
Understand minicomputer control systems ..... Apr. 153
Applying analyzers in the process industries ..... June 45
New strategy improves dual composition column control ... June 51
New analyzers improve reformer efficiency ..... June 60
Combustion control and analyzers: What's really needed? .. June 65
Insulation design: Using the new computer programs ..... July 83
Optimize cold cycles ..... July 89
How to implement digital control ..... July 115
CRT based systems: What's in it for the operator? ..... July 135
Plot plans must include safety ..... July 183
Improve reliability of advanced tower control ..... Oct. 117
Models aid process control ..... Nov. 197

INTERNATIONAL TRADE
LNG grows as world energy resource ..... Apr. 130
Challenges from the Canadian North ..... May 68-G
Mexican energy, economics and exploration ..... Sept. 50-F
Is more refining needed? ..... Nov. 171
Europe's international gas trade ..... Dec. 68-L

INVENTORIES
Better ways to clean crude storage tanks and desalters ..... Jan. 82
Stability of alternate fuels ..... July 77
Simple method calculates tank shell distortion ..... Aug. 101

ISOBUTANE
Now, MTBE from butane ..... Oct. 91

ISOBUTENE
Now, MTBE from butane ..... Oct. 91

ISOMERIZATION
Components for unleaded gasoline ..... Feb. 57
Refining operations update ..... Mar. 55
Better use of butenes for high-octane gasolines ..... Apr. 185
Upgrade naphtha to ... fuels and feedstocks ..... May 110
Erratum ..... *July 54*
Refining process handbook ..... Sept. 93
Now, MTBE from butane ..... Oct. 91
Kinetics of cat reforming ..... Nov. 163

ISOSIV PROCESS
Upgrade naphtha to ... fuels and feedstocks ..... May 110
Erratum ..... *July 54*

LEAKAGE
First step: Survey energy losses ..... July 62

LEGISLATION
Landfarming fills an HPI need ..... June 97
Is more refining needed? ..... Nov. 171

LIQUEFACTION
Coal to gasoline via syn gas ..... Feb. 67
Data bank for synthetic fuels (Part 1) ..... May 229
Possibilities for coal liquefaction ..... May 237
Coal conversion today ..... July 68
Erratum ..... *Oct. 57*
Process coal using nuclear energy ..... July 153
Data bank for synthetic fuels (Part 2) ..... Aug. 117
Convert coal now ..... Sept. 238
Data bank for synthetic fuels (Part 3) ..... Nov. 225

LIQUEFIED NATURAL GAS (LNG)
LNG grows as world energy resource ..... Apr. 130
Mercury - LNG's problem ..... Nov. 237
Gas - energy of the future ..... Nov. 76-O
Europe's international gas trade ..... Dec. 68-L

LIQUEFIED PETROLEUM GAS (LPG)
Why an LPG olefins plant? ..... Apr. 223
Plot plans must include safety ..... July 183
Refine LPG for process flexibility ..... Dec. 111

LUBRICANTS
Engineering aspects of the EXOL N lube process ..... May 119
Solvent treat resids ..... May 150
Lube and wax capacity identified ..... May 157
New ways to estimate characterization of lube cuts ..... July 171
Refining process handbook ..... Sept. 93
Apply pure oil mist lubrication on a large scale ..... Oct. 125

MAINTENANCE
Maintenance techniques for turbomachinery ..... Jan. 71
Can a computer reduce your maintenance? ..... Jan. 79
Better ways to clean crude storage tanks and desalters ..... Jan. 82
Predict pump problems with IFD ..... Jan. 87
Vibration analysis pinpoints coupling problems ..... Jan. 95
Improve water treating systems ..... Jan. 99
Why contract maintenance? ..... Jan. 103
Flange fitup problems? Try a dutchman ..... Jan. 105
Choose the right seal ..... Jan. 107
Insulating tanks: What it costs and how it's done ..... Apr. 165
Shaft overlays proven effective ..... May 191
Tank insulation costs up? Try urethane foam ..... May 197
Keys to successful cooling tower operation ..... May 203
First step: Survey energy losses ..... July 62
Easy alignment measurements for gear-type couplings .... Sept. 245
Apply pure oil mist lubrication on a large scale ..... Oct. 125
Guidelines help combustion engineers ..... Nov. 205

MANAGEMENT
Design of aerobic treatment units (Part 3) ..... Jan. 159
Major factors to consider in project financing ..... Jan. 189
Build an article writing program ..... Jan. 199
Control project costs effectively ..... Feb. 127
Pick a process by design ..... Mar. 75
Plan steps to build your success ..... Mar. 137
World money resources for project finance ..... Mar. 167
Can new shift schedules motivate? ..... Apr. 249
Can engineers/constructors cope with tomorrow's challenge? ..... Apr. 259
Get ready for megaprojects (Part 1) ..... Apr. 283
Be more productive: Implement company strategy ..... May 137
Plant testing peaks performance ..... May 159
Audit your organization's status ..... May 265
Fault tree analysis: How useful? ..... May 275
Get ready for megaprojects (Part 2) ..... May 291
Landfarming fills an HPI need ..... June 97
PEPRS tells engineering progress ..... June 137
Put clarity in your writing ..... June 143
What the 'Whirlpool case' means for your plant's operation ..... June 161

Energy - progress and prospects ..... July 57
Know energy information resources ..... July 94
Power and organizational politics ..... July 199
Where the candidates stand ..... July 235
Your career can be planned ..... Aug. 125
Seek intrinsically safe plants ..... Aug. 137
Failure analysis: Tool for HPI loss prevention ..... Aug. 155
Conduct meetings that get things done ..... Sept. 275
Control your costs with earned value concept ..... Sept. 289
Improve effectiveness of job/person interaction ..... Sept. 303
What are you doing about productivity ..... Sept. 315
Minimize stormwater system costs ..... Oct. 59
Process problems to profits ..... Oct. 71
Improve productivity in your plant ..... Oct. 159
Investigate suppliers to maintain quality control ..... Oct. 171
Creative growth games (Part 1) ..... Oct. 189
Run a good safety/health program ..... Oct. 193
Let's build a plant ..... Nov. 249
Creative growth games (Part 2) ..... Nov. 257
When you're a project engineer ..... Nov. 263
This fixed-shift approach enhances continuous operation ..... Nov. 276
Seek overseas tax fairness ..... Nov. 279
Should workers participate in management process? ..... Nov. 285
Train for cross-cultural needs ..... Nov. 293
Supervisory management ..... Dec. 75

MATERIALS HANDLING
Shop or field fabricate? Transportation is often the key ..... Jan. 153

MELAMINE
From hydrocarbons to petrochemicals (Part 17) ..... Jan. 141

MEMBRANE SEPARATION
Membrane separation saves energy ..... July 65

METALS
Shaft overlays proven effective ..... May 191
Mercury - LNG's problem ..... Nov. 237

METHANATION
Ruthenium catalysts improve methanation ..... Apr. 107
Incentive for sulfur-tolerant methanol catalyst ..... Nov. 157

MOLECULAR SIEVES
Refining process handbook ..... Sept. 93
Make olefins from syn gas ..... Nov. 139

MOTORS
Vibration analysis pinpoints coupling problems ..... Jan. 95
Synchronous motors ... avoid torsional vibration problems .. Feb. 97
FCCU expanders: What's the payout? ..... Apr. 173
Easy alignment measurements for gear-type couplings .... Sept. 245
Apply pure oil mist lubrication on a large scale ..... Oct. 125

NATURAL GAS see also LIQUEFIED NATURAL GAS; METHANE; SUBSTITUTE NATURAL GAS
Purify CO_2 for use ..... Apr. 113
Off-gas aids Claus operations ..... Apr. 127
LNG grows as world energy resource ..... Apr. 130
NGL refrigerant improves recovery ..... Apr. 138
Plant testing peaks performance ..... May 159
Energy - progress and prospects ..... July 57
Consider nitrogen rejection design ..... Aug. 111
Now, MTBE from butane ..... Oct. 91
Program calculates gas physical properties ..... Nov. 213
Let's build a plant ..... Nov. 249
Gas -- energy of the future ..... Nov. 76-O
Europe's international gas trade ..... Dec. 68-L

NGL
NGL refrigerant improves recovery ..... Apr. 138

NITRIC ACID
Destroy NO_x catalytically ..... Feb. 87

NITROGEN
Control of NO_x emissions ..... Jan. 167
Consider nitrogen rejection design ..... Aug. 111

NITROGEN OXIDES see ACID GASES

NYLONS
From hydrocarbons to petrochemicals (Part 17) ..... Jan. 141
From hydrocarbons to petrochemicals (Part 18) ..... Apr. 211
Erratum ..... *Aug. 56*

OLEFINS
A new concept for ... Three phase fluidized beds ..... Jan. 123
Improve naphtha cracker operation ..... Feb. 79
Erratum ..... *May 99*
Better use of butenes for high-octane gasoline ..... Apr. 185
Cut steam cracker capital costs ..... Apr. 233
Make petrochemical feedstocks with coal liquefaction ..... May 152
Improve processes by OSA ..... May 215
Light olefin trends in Western Europe ..... May 223
Up olefin plant profits by steady state simulation ..... Aug. 95
Refining process handbook ..... Sept. 93
Cut demethanizer energy costs ..... Oct. 105
Olefins shift to heavy liquids ..... Oct. 113
Make olefins from syn gas ..... Nov. 139
Cut olefin costs by optimum coupling ..... Dec. 105
Refine LPG for process flexibility ..... Dec. 111

OXIDATION
Stability of alternate fuels ..... July 77
Naphtha wash eliminates soot problem ..... Sept. 237
Erratum ..... *Dec.*
Up petrochemical value by liquid phase catalytic oxidation ..... Nov. 107
Hi-yield DMT by Mitsui ..... Nov. 143
Benzene or butane for MAN ..... Nov. 149

OXO REACTION
2-EH: What you should know ..... Nov. 93

OXYGEN
Process coal using nuclear energy ..... July 153

PARTIAL OXIDATION
Coal to gasoline via syn gas ..... Feb. 87

PIPING
Flange fitup problems? Try a dutchman ..... Jan. 105
Plot plans must include safety ..... July 183
Perform pipe stress analysis on a minicomputer ..... Dec. 87
Calculate natural frequency of internal lined pipe ..... Dec. 94
Aid to firewater design ..... Dec. 137

POLYACETALS
From hydrocarbons to petrochemicals (Part 17) ..... Jan. 141

POLYESTERS
From hydrocarbons to petrochemicals (Part 17) ..... Jan. 141
From hydrocarbons to petrochemicals (Part 18) ..... Apr. 211
Erratum ..... *Aug. 56*

POLYETHYLENE
What's ahead for U.S. HD-PE? ..... Sept. 231

POLYMERIZATION
Components for unleaded gasoline ..... Feb. 57
Trends in suspension PVC manufacture ..... Mar. 39
Refining operations update ..... Mar. 55
How first Dimersol is working ..... May 143
Stability of alternate fuels ..... July 77

POLYOLEFINS
From hydrocarbons to petrochemicals (Part 18) ..... Apr. 211
Erratum ..... *Aug. 56*

POLYPHENYLENE SULFIDE
From hydrocarbons to petrochemicals (Part 17) ..... Jan. 141

POLYPROPYLENE
Use BPP for polypropylene ..... Nov. 131

POLYVINYL CHLORIDE
Trends in suspension PVC manufacture ..... Sept. 39

PRESSURE VESSELS see VESSELS

PROPANE
Why an LPG olefins plant? ..... Apr. 223
Make petrochemical feedstocks with coal liquefaction ..... May 152

PROPERTY DATA
State-of-the-art: Property predictions ..... Mar. 107
Predict thermal expansion of petroleum ..... Apr. 229

PROPYLENE
Why an LPG olefins plant? ..... Apr. 223
How first Dimersol is working ..... May 143
Light olefins trends in Western Europe ..... May 223
Olefins shift to heavy liquids ..... Oct. 113
Use BPP for polypropylene ..... Nov. 131

PUMPS
Predict pump problems with IFD ..... Jan. 87
Flange fitup problems? Try a dutchman ..... Jan. 105
Choose the right seal ..... Jan. 107
Stepwise solution to vibrating equipment foundation design ..... Mar. 93
Apply pure oil mist lubrication on a large scale ..... Oct. 125
Aid to firewater design ..... Dec. 137

RCD UNIBON PROCESS
New data for RCD Unibon ..... June 73
Erratum ..... *Sept. 91*

REACTORS
Predict carbonation rate on iron catalyst ..... Feb. 92
Pick a process by design ..... Mar. 75
Solve more distillation problems (Part 9) ..... Apr. 195
Refining process handbook ..... Sept. 93
Kinetics of cat reforming ..... Nov. 163

RECTISOL PROCESS
Incentive for sulfur-tolerant methanol catalyst ..... Nov. 157

REFORMING
Components for unleaded gasoline ..... Feb. 57
Economics of component splitting ..... Feb. 60

Refining operations update ..... Mar. 55
New analyzers improve reformer efficiency ..... June 60
Refining process handbook ..... Sept. 93
Upgrading coal products can affect environment ..... Oct. 79
Kinetics of cat reforming ..... Nov. 163
Is more refining needed? ..... Nov. 171

REFRIGERANT
NGL refrigerant improves recovery ..... Apr. 138

REFRIGERATION
Consider nitrogen rejection design ..... Aug. 111
Refining process handbook ..... Sept. 93

RESIDUES
Solvent treat resids ..... May 150
Landfarming fills an HPI need ..... June 97
Improve vapor pressure prediction ..... July 163
Erratum ..... *Sept. 91*
Hydrogen for future refining ..... Aug. 85
Refining process handbook ..... Sept. 93
Is more refining needed? ..... Nov. 171

RESINS
From hydrocarbons to petrochemicals (Part 17) ..... Jan. 141

SAFETY
Use flammable vapor sensors? ..... Jan. 211
Fault tree analysis: How useful? ..... May 275
What the 'Whirlpool case' means for your plant's operation ..... June 161
Plot plans must include safety ..... July 183
Compare codes for relief valve calculations ..... Aug. 69
Seek intrinsically safe plants ..... Aug. 137
Failure analysis: Tool for HPI loss prevention ..... Aug. 155
Run a good safety/health program ..... Oct. 193
Formic acid ..... Nov. 120
Aid to firewater design ..... Dec. 137

SEALS
Choose the right seal ..... Jan. 107

SHALE OIL
Energy - progress and prospects ..... July 57
Stability of alternate fuels ..... July 77

SOLUBILITY
Lube solvents no threat to waste treatment ..... Oct. 63

SOLVENT REFINING
Engineering aspects of the EXOL N lube process ..... May 119
Lube and wax capacity identified ..... May 157
Refining process handbook ..... Sept. 93

SPECIFIC GRAVITY
Simplify property predictions ..... Mar. 115

SPECIFICATIONS see also STANDARDS
Stability of alternate fuels ..... July 77

STABILITY
Stability of alternate fuels ..... July 77

STANDARDS
New API vessel inspection code ..... May 135
What's the difference between TEMA exchanger classes? ... June 92
Plot plans must include safety ..... July 183
How to prevent valve problems ..... Aug. 67
Compare codes for relief valve calculations ..... Aug. 69

STORAGE see INVENTORIES

STRIPPING
How steam alters crude ..... Jan. 115
Engineering aspects of the EXOL N lube process ..... May 119

SUBSTITUTE NATURAL GAS (SNG)
Ruthenium catalysts improve methanation ..... Apr. 107
How to convert biomass to SNG ..... Apr. 117
Coal conversion today ..... July 68
Erratum ..... *Oct. 57*
Upgrading coal products can affect environment ..... Oct. 79
Incentive for sulfur-tolerant methanol catalyst ..... Nov. 157
Gas - energy of the future ..... Nov. 76-O

SULFUR
Off-gas aids Claus operations ..... Apr. 127
Incentive for sulfur-tolerant methanol catalyst ..... Nov. 157
Properties of elemental sulfur ..... Nov. 217
Let's build a plant ..... Nov. 249
FGD good with coal conversion ..... Dec. 117

SULFURIC ACID
Curve fitting by computer ..... Aug. 107

SURFACE TENSION
Estimate surface tension changes for liquids ..... Apr. 207

SYNCRUDE
Stability of alternate fuels ..... July 77
Upgrading coal products can affect environment ..... Oct. 79

TAR SANDS
Stability of alternate fuels ..... July 77

TEREPHTHALIC ACID
From hydrocarbons to petrochemicals (Part 18) ..... Apr. 211
Erratum ..... *Aug. 56*
Hi-yield DMT by Mitsui ..... Nov. 143

THERMODYNAMICS
State-of-the-art: Property predictions ..... Mar. 107

TOTAL ISOMERIZATION PROCESS (TIP)
Upgrade naphtha to...fuels and feedstocks ..... May 110
Erratum ..... *July 54*

TOLUENE
Aromatics outlook in Western Europe ..... Mar. 83

TREATING
Improve water treating systems ..... Jan. 99
Refining operations update ..... Mar. 55
Treat fuel gas -- save energy ..... Mar. 67
Erratum ..... *May 99*
Better use of butenes for high-octane gasoline ..... Apr. 185
Engineering aspects of the EXOL N lube process ..... May 119
How to select hydrotreating catalyst ..... May 139
Lube and wax capacity identified ..... May 157
New data for RCD Unibon ..... June 73
Erratum ..... *Sept. 91*
Hydrogen for future refining ..... Aug. 85
Refining process handbook ..... Sept. 93
Minimize stormwater system costs ..... Oct. 59
Lube solvents no threat to waste treatment ..... Oct. 63
Nonchromate treatment performs well ..... Oct. 75
Packed beds best for sulfur removal ..... Oct. 99
Incentive for sulfur-tolerant methanol catalyst ..... Nov. 157

TURBINES
Vibration analysis pinpoints coupling problems ..... Jan. 95
FCCU expanders: What's the payout? ..... Apr. 173
Shaft overlays proven effective ..... May 191
Easy alignment measurements for gear-type couplings .... Sept. 245

UREA
From hydrocarbons to petrochemicals (Part 17) ..... Jan. 141

UTILITIES
Improve water treating systems ..... Jan. 99
How steam alters crude ..... Jan. 115
Design of aerobic treatment units (Part 3) ..... Jan. 159
Is your power distribution system reliable? ..... May 169
Better service from rotary screw air compressor packages .. May 181
Keys to successful cooling tower operation ..... May 203
First step: Survey energy losses ..... July 62
Combined cycles: Today and tomorrow ..... July 73
Nonchromate treatment performs well ..... Oct. 75
Design plant-wide heat recovery ..... Nov. 245

VALVES
Selecting valves for the HPI ..... Aug. 61
Erratum ..... *Sept. 91*
How to prevent valve problems ..... Aug. 67
Compare codes for relief valve calculations ..... Aug. 69

VAPORIZATION
How steam alters crude ..... Jan. 115
Improve vapor pressure prediction ..... July 163
Erratum ..... *Sept. 91*
New ways to estimate characterization of lube cuts ..... July 171
Curve fitting by computer ..... Aug. 107

VESSELS
Better ways to clean crude storage tanks and desalters ..... Jan. 82
Shop or field fabricate? Transportation is often the key .... Jan. 153
Insulating tanks: What it costs and how it's done ..... Apr. 165
Engineering aspect of the EXOL N lube process ..... May 119
New API vessel inspection code ..... May 135
Refinery on skids speeds startup ..... May 161
Plot plans must include safety ..... July 183
Simple method calculates tank shell distortion ..... Aug. 101
Aid to firewater design ..... Dec. 137

VIBRATION
Predict pump problems with IFD ..... Jan. 87
Synchronous motors ... avoid torsional vibration problems .. Feb. 97
Calculate natural frequency of internal lined pipe ..... Dec. 94

VISBREAKING
Refining operations update ..... Mar. 55
New roles for thermal cracking ..... May 101

VISCOSITY
New ways to estimate characterization of lube cuts ..... July 171
Estimate viscosity vs. temp. ..... Dec. 131

WASTEWATER
Design of aerobic treatment units (Part 3) ..... Jan. 159
Minimize stormwater system costs ..... Oct. 59
Lube solvents no threat to waste treatment ..... Oct. 63
Process pollutes very little ..... Oct. 66
Upgrading coal products can affect environment ..... Oct. 79

WAXES
Lube and wax capacity identified ..... May 157
Refining process handbook ..... Sept. 93

XYLENES see AROMATICS

Authors

Abdel-Halim, T.A. ..... Jan. 115
Aguilo, A. ..... Nov. 120
Albertini, E. ..... Mar. 101
Allen, E.D. ..... Nov. 179
Amin, M.B. ..... Dec. 131
Anonymous ..... Mar. 55, May 157, June 97, Oct. 139
Anthony, R.G. ..... Apr. 195

Baggio, J.L. ..... Apr. 138
Bajek, W.A. ..... June 60
Baker, W.J. ..... May 173
Barbieri, R. ..... Mar. 101
Barnett, J.W. ..... Jan. 82
Bayne, A.R. ..... Nov. 103
Benedek, W.J. ..... May 143
Betke, W.C. Jr. ..... Apr. 173
Bentzen, G.W. ..... Apr. 195 Also July 144
Beyers, C.K. ..... Aug. 155
Blasdel, J.E. ..... Oct. 75
Blevins, T.L. ..... Nov. 197
Bloch, H.P. ..... Jan. 87 Also Oct. 125
Bonacci, J.C. ..... Nov. 179
Boom, J. ..... Sept. 237
Bornhofen, L. ..... Mar. 34-J
Bowden, J. ..... July 77
Brecht, C. ..... Nov. 76-O
Brinkman, D. ..... July 77
Brule, M.R. ..... May 229 Also Aug. 117, Nov. 225
Buhrow, R.P. ..... May 135
Buividas, L.J. ..... Apr. 68-G
Bush, W.D. ..... Nov. 263
Bush, W.H. ..... Oct. 71
Bushnell, J.D. ..... May 119

Cameron, J.B. ..... Mar. 39
Campbell, L.H. ..... Apr. 249
Carter, C.J. ..... Jan. 103
Carter, C.P. ..... Nov. 171
Chang, H.-Y. ..... Aug. 79
Chao, J. ..... May 229 Also Aug. 117, Nov. 217, Nov. 225
Chen, C.C. ..... Apr. 122
Christman, J. ..... Sept. 257
Clark, R.L. ..... Oct. 171
Clavin, J.S. ..... Oct. 75
Coe, W.W. ..... May 130
Cook, D. ..... Nov. 213
Copigneaux, P. ..... Aug. 69
Corneil, H. ..... Aug. 85
Cornils, B. ..... Nov. 93
Craig, R.G. ..... Dec. 111
Czaikowski, M.P. ..... Nov. 103

Dalla Betta, R.A. ..... Nov. 157
Dalla Casa, P. ..... Mar. 101
Daubert, T.E. ..... Mar. 107 Also Mar. 115
de Swardt, N. ..... July 50-J
DiBiano, R.J. ..... Oct. 117
Diesterweg, G. ..... Nov. 191
Dry, M. ..... Feb. 92

Eisele, P. ..... Aug. 95
Emig, G. ..... June 83
England, G.C. ..... Jan. 167

Fedeli, V. ..... Oct. 54-M
Fernandez, L. ..... Feb. 87
Fiocco, R.J. ..... May 119
Frank, J.R. ..... Apr. 117
Fuge, C. ..... Aug. 95
Furlani, P. ..... Mar. 83

Gallagher, W.E. ..... Oct. 59
Gants, R.M. ..... Nov. 279
Garcia, J.C. ..... Sept. 50-F
Garkisch, O.L. ..... Sept. 238
Gaultier, T.L. ..... July 89
Gearhart, J.A. ..... May 150
Gormley, R.J. ..... Nov. 139
Goyal, O.P. ..... Nov. 205
Green, P.W. ..... June 45
Gutterman, G. ..... Apr. 161

Hammett, J.J. Jr. ..... July 135
Hamaker, J.D. ..... Nov. 213
Harkins, H.L. ..... July 73
Harney, B.M. ..... Feb. 67
Harris, G.A. ..... May 152
Harris, J. ..... June 161
Harris, R.A. ..... Aug. 111
Harstad, P. ..... Sept. 237
Hashimoto, H. ..... Nov. 131
Hatch, L.F. ..... Jan. 141 Also Apr. 211, May 207
Haynes, M.E. ..... Sept. 275
Heap, M.P. ..... Jan. 167
Heck, R.M. ..... Apr. 185 Also Nov. 179
Heinzelmann, F. ..... Aug. 85
Hiller, H. ..... Sept. 238
Hoffman, H.L. ..... Feb. 57
Holland, C.D. ..... Apr. 195 Also July 144
Horlenko, T. ..... Nov. 120
Hossain, S.M. ..... Oct. 79
Huang, W. ..... Feb. 79 Also May 215, Sept. 223, Oct. 105, Dec. 105
Hurlburt, H. ..... Aug. 107
Hwang, J.J. ..... Dec. 105

Inada, K. ..... Jan. 133
Izarraraz, A. ..... Apr. 195

Jackson, A. ..... Sept. 251
Jenkins, J.H. ..... Nov. 163

Kakugo, M. ..... Nov. 131
Kaminsky, W. ..... Nov. 187
Kampen, W.H. ..... Feb. 72
Kane, L.A. ..... June 65
Karanth, N.G. ..... Sept. 262
Kardaun, G. ..... Dec. 68-L
Katzler, J. ..... May 197
Kaura, M.L. ..... July 183 Also Dec. 137
Kawamura, H. ..... Aug. 61
Keating, C.J. ..... Dec. 101
Kellett, T.F. ..... May 139
Kelly, E.A. ..... June 36-O
Kennard, M.L. ..... Apr. 103
Kerridge, A.E. ..... Feb. 127
Kesler, M.G. ..... July 163
Klein, R.A. ..... Oct. 113
Kletz, T. ..... Aug. 137
Knieriem, H., Jr. ..... July 65
Koczwara, F.A. ..... Aug. 101
Kohli, H. ..... Mar. 167
Kono, H. ..... Jan. 123
Kurzawa, C.J. ..... Apr. 238 Also May 291

Lambers, J.H. ..... Dec. 68-L
Law, J.A. ..... Nov. 249
Le Blanc, J.B. ..... Apr. 68-G
Lee, B.I. ..... July 163
Lee, L.L. ..... May 229 Also Aug. 117, Nov. 225
Leeper, J.E. ..... Nov. 237
Lin, C.T. ..... May 229 Also Aug. 117 Nov. 225
Linde, A. ..... Aug. 95
Lipman, T.V. ..... Nov. 293
Loen, R.O. ..... Sept. 315
Lucet, M. ..... July 89
Lundeen, A.J. ..... Mar. 39
Lyons, J.E. ..... Nov. 107

McClung, R.G. ..... Apr. 185
McCulley, J.H. ..... Mar. 39
McDonald, B.B. ..... May 137
McKetta, J.J. ..... July 57

MacArthur, J.B. ..... Dec. 101
Maciula, E.A. ..... May 115
Maddox, R.N. ..... Dec. 131
Magill, L.G. ..... Oct. 79
Mahendroo, R.K. ..... Nov. 179
Malow, M. ..... Nov. 149
Manning, E., Jr. ..... Nov. 245
Martin, J.F. ..... Nar. 67
Marzo, L. ..... Feb. 87
Matar, S. ..... Jan. 141 Also Apr. 211, May 207
Mathur, S. ..... July 62
Matsuyama, K. ..... Nov. 131
Mauleon, J.L. ..... May 143
Maxwell, J.H. ..... Jan. 95
Meisen, A. ..... Apr. 103
Meissner, R.E. ..... Apr. 113
Mendenhall, M.D. ..... May 191
Messing, A. ..... Oct. 193
Michel, J.F. ..... July 89
Mills, G.A. ..... Feb. 67
Miner, J. ..... July 83
Mol, A. ..... Apr. 233
Mommessin, P. ..... July 144
Monroe, R.C. ..... Dec. 122
Montgomery, G. ..... Dec. 87
Mort, C.L. ..... May 68-G
Muddarris, G.R. ..... Oct. 91
Mueller, D. ..... June 143
Mueller, J.F. ..... May 169
Mueller-Maerki, F. ..... Nov. 285
Mullen, A. ..... Nov. 93
Murray, M.G., Jr. ..... Jan. 105 Also Sept. 245
Myake, T. ..... Jan. 133

Netzer, D ..... Dec. 117
Niedleman, S.L. ..... Nov. 135
Nelson, W.E. ..... Jan. 71
Ng, A. ..... Apr. 122
Nichols, J.D. ..... Oct. 75

Padmanabhan, V.R. ..... Mar. 137
Panesar, K.S. ..... Jan. 107
Pascik, I. ..... Nov. 191
Pascoli, R. ..... Apr. 259
Patel, G.R. ..... Nov. 179
Perrault, N. ..... Nov. 276
Perry, R.S. ..... Aug. 67
Pershing, D.W. ..... Jan. 167
Pettman, M.J. ..... Oct. 91
Petty, L.E. ..... May 159
Picciotti, M. ..... Apr. 223 Also Oct. 54-M
Pilz, V. ..... May 275
Pollard, E.I. ..... Feb. 97
Ponder, T.C. ..... Sept. 231
Prater, H.P. ..... Oct. 159

Rajarm, S. ..... Oct. 134
Rao, V.U.S. ..... Nov. 139
Raudsepp, E. ..... July 199 Also Aug. 125, Sept. 303, Oct. 189, Nov. 257
Redding, J.H. ..... Jan. 79
Riazi, M.R. ..... Mar. 115
Richter, G.N. ..... Oct. 66
Rogers, F. ..... July 235
Rowe, E.H. ..... Oct. 63
Rubin, B.D. ..... Oct. 79
Rubin, F.L. ..... Jun. 92 Also Oct. 147
Russell, R.W. ..... May 223
Ryskamp, C.J. ..... June 51

Saintherant, P. ..... Apr. 138
Sallenbach, H.G. ..... Mar. 93
Saltz, E.X. ..... May 161
Sandefur, M.J. ..... July 115
Sartor, A.F. ..... May 139
Scher, C ..... Dec. 117
Schlinger, W.G. ..... Oct. 66
Schnetzler, H. ..... Aug. 95
Seko, M. ..... Jan. 133
Shaeffer, J. ..... Jan. 211
Shah, M.N. ..... Apr. 68-G
Shaw, G.C. ..... Apr. 153
Shiga, A. ..... Nov. 131
Sifferman, T.R. ..... May 124
Sikona, J.G. ..... June 73
Sinn, H. ..... Nov. 187
Sinnett, C.E. ..... May 152
Starling, K.E. ..... May 229 Also Aug. 117, Nov. 225
Sterbenz, P. ..... July 68
Stolfa, F. ..... May 101
Streeter, R.C. ..... Apr. 107
Sun, Y.-C. ..... Oct. 99
Swift, H.E. ..... May 152
Symoniak, M.F. ..... May 110

Taggart, G. ..... Apr. 133
Thomas, W.B. ..... Jan. 99 Also May 203
Toulet, J.P. ..... July 89
Tran, P.T. ..... Dec. 94
Trevino, C.A. ..... May 139
Truong, K.T. ..... Dec. 94
Tucci, E.R. ..... Apr. 107
Tullos, L.F., Jr. ..... Oct. 63
Tuskamoto, A. ..... Aug. 52-F

Ueda, T. ..... Nov. 143
Uppal, K.B. ..... Apr. 165
Ushiba, K.K. ..... Nov. 157

van Aubel, L.J. ..... Sept. 237
van Horn, L.D. ..... Apr. 145
van Ormer, H.P. ..... May 181
Vervalin, C.H. ..... Jan. 189 Also July 94, Dec. 75
Visser, P. ..... Sept. 237

Wall, J.D. ..... July 57
Walsh, D. ..... Nov. 276
Webb, O. ..... Apr. 185
Wells, D.D. ..... Jan. 153
White, E.A. ..... Dec. 111
Whited, J.D. ..... Jan. 153
Wiley, S. ..... Apr. 127
Williams, A.O. ..... June 45
Wilson, R.H. ..... May 159
Witt, M.P. ..... Apr. 185
Wohlfahrt, K. ..... June 83
Wojciechowski, B.W. ..... Mar. 75 Also May 237, July 153
Woodle, R. ..... July 171
Wynton, J.S. ..... Sept. 289

Yarborough, L. ..... May 159
Yeager, J. ..... July 199 Also Aug. 125, Sept. 303
Young, F.K. ..... May 229 Also Aug. 117, Nov. 225
Young, R.I. ..... Jan. 199
Young, W.G. ..... June 137

Zanker, A. ..... Apr. 207

Page number with letter suffix denotes International Edition only.

Index reprints can be obtained by writing the Reprint Dept., HYDROCARBON PROCESSING, Box 2608, Houston, Texas 77001.